TOEHO 6666860

FIG. 1

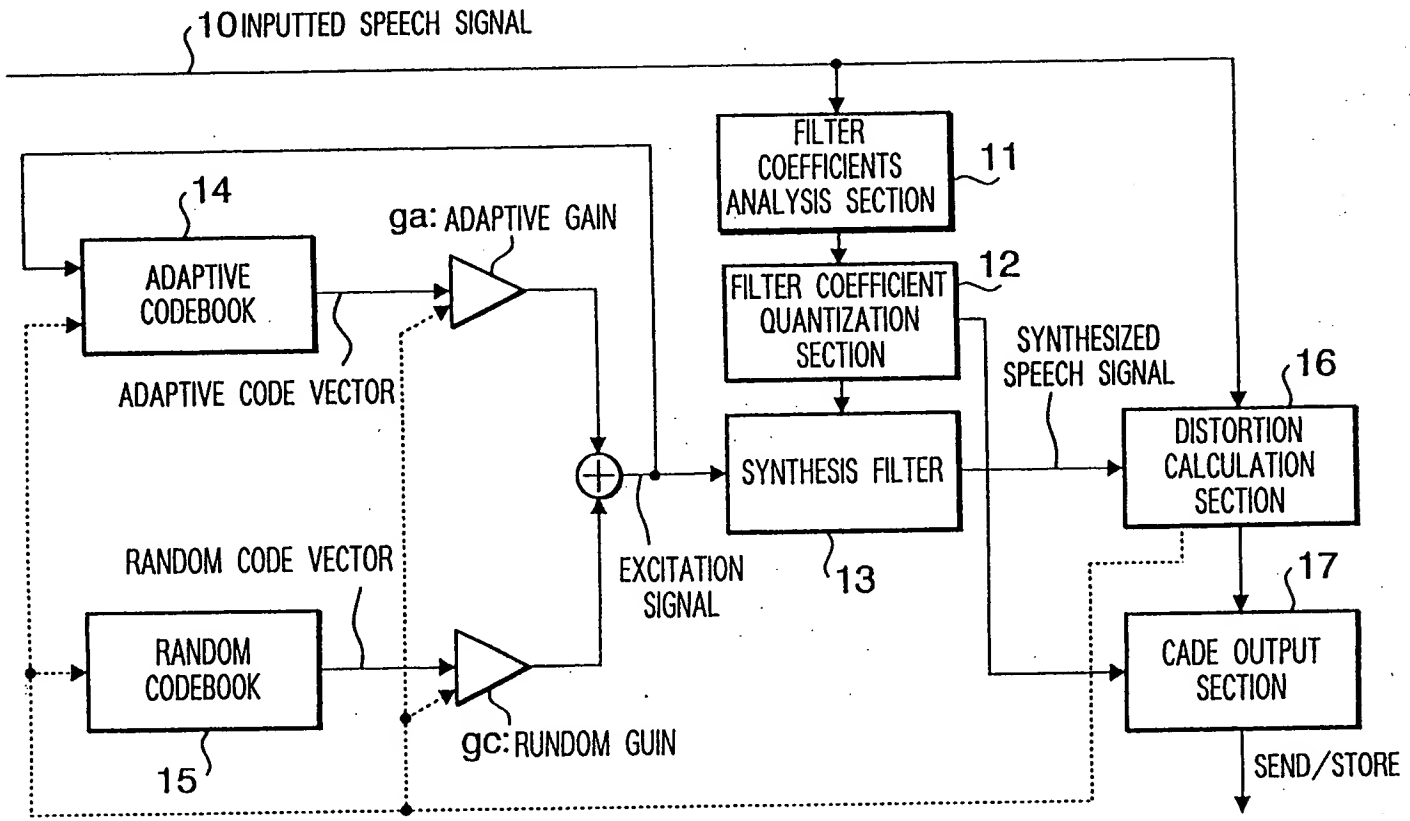

FIG. 2A

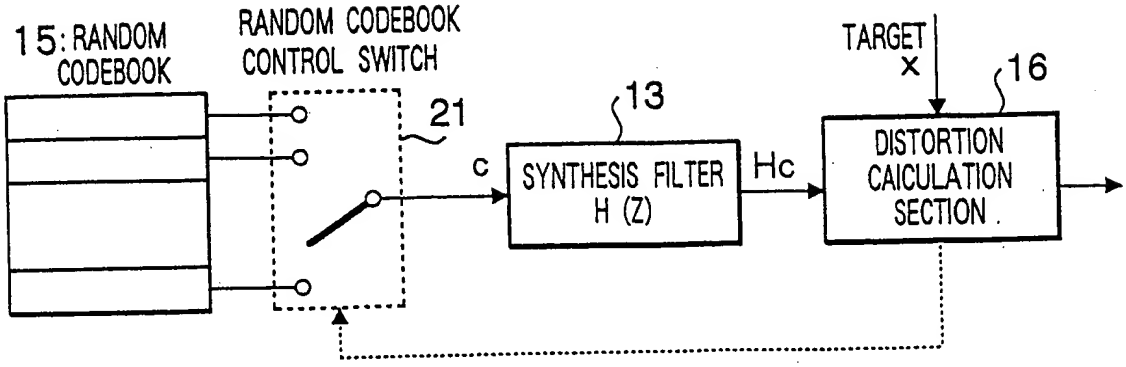

FIG. 2B

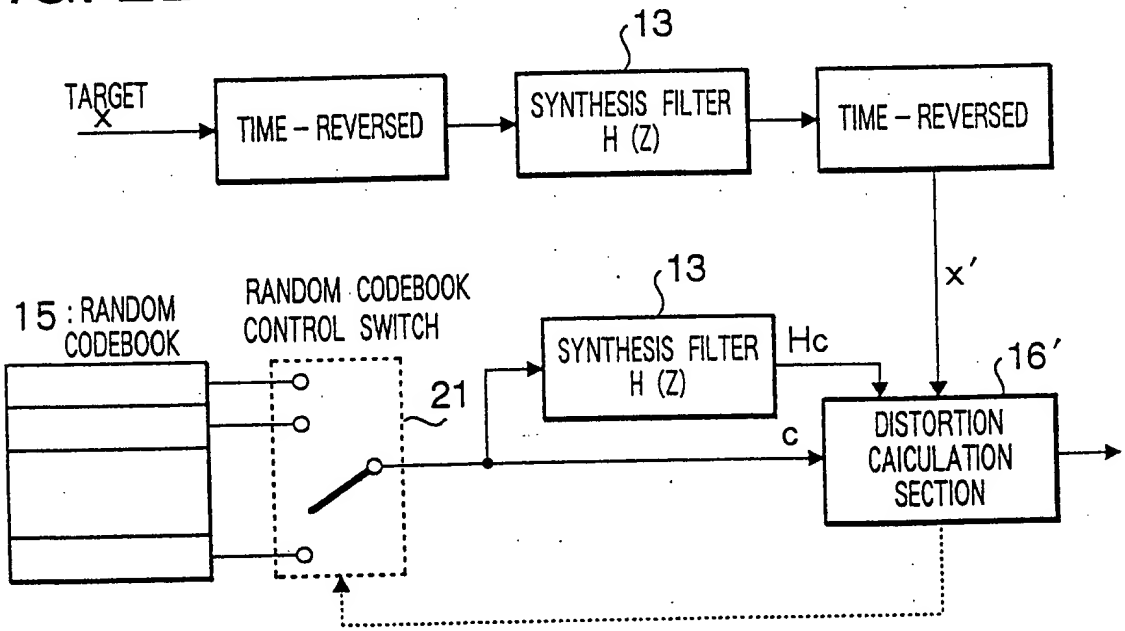

FIG. 2C

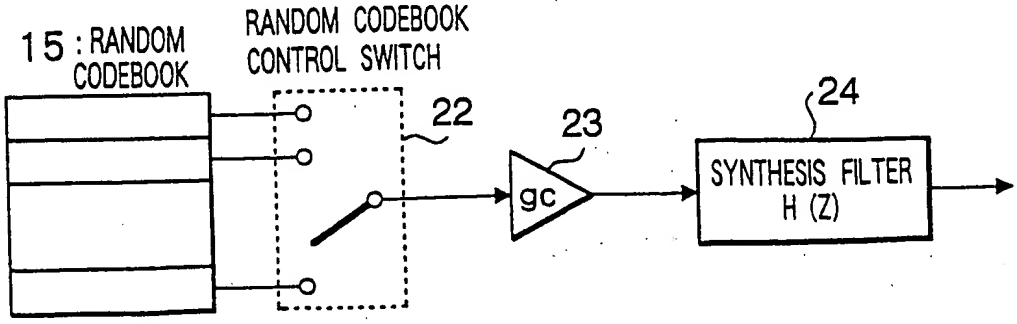

FIG. 3

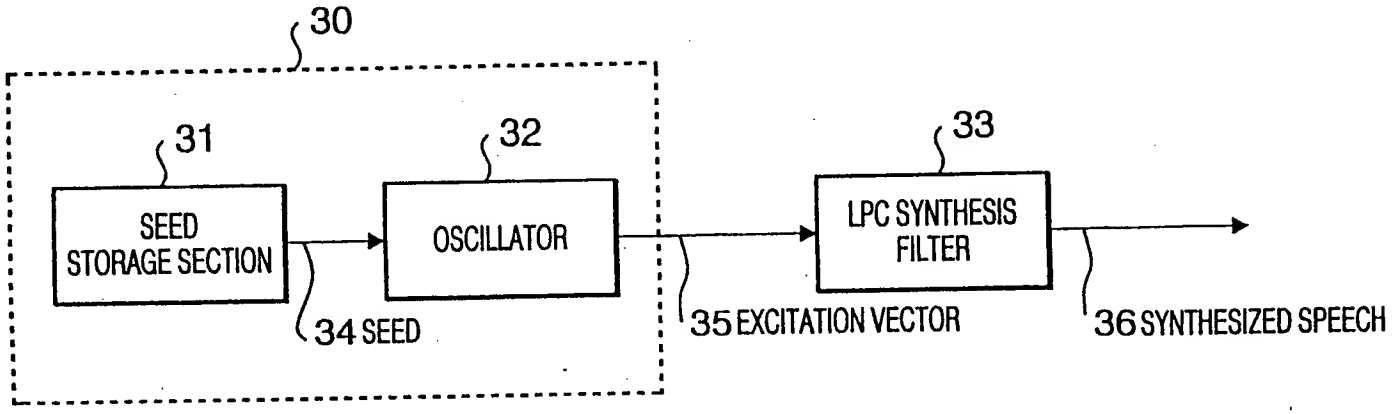
30
31
SEED STORAGE SECTION
32
OSCILLATOR
33
LPC SYNTHESIS FILTER
34 SEED
35 EXCITATION VECTOR
36 SYNTHESIZED SPEECH

FIG. 4

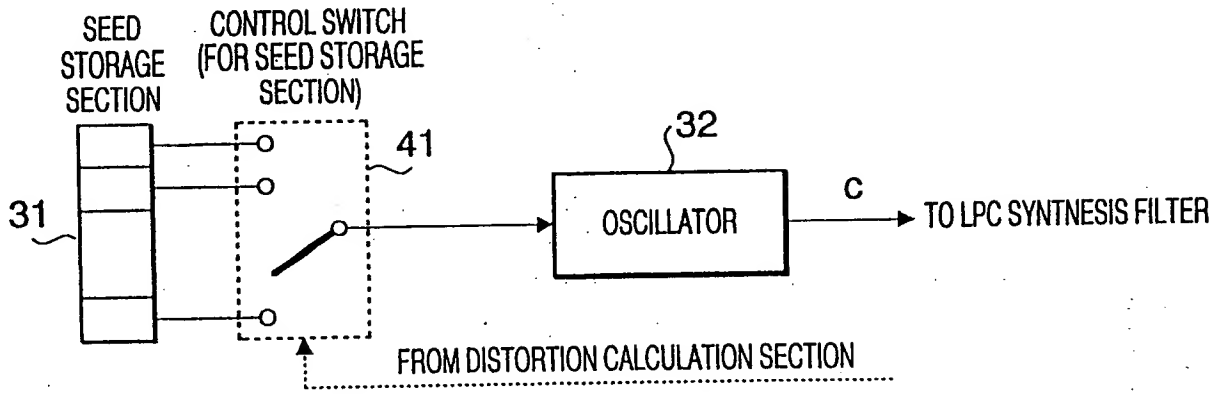
SEED STORAGE SECTION
CONTROL SWITCH (FOR SEED STORAGE SECTION)
31
41
32
OSCILLATOR
c
TO LPC SYNTNESIS FILTER
FROM DISTORTION CALCULATION SECTION

FIG. 5

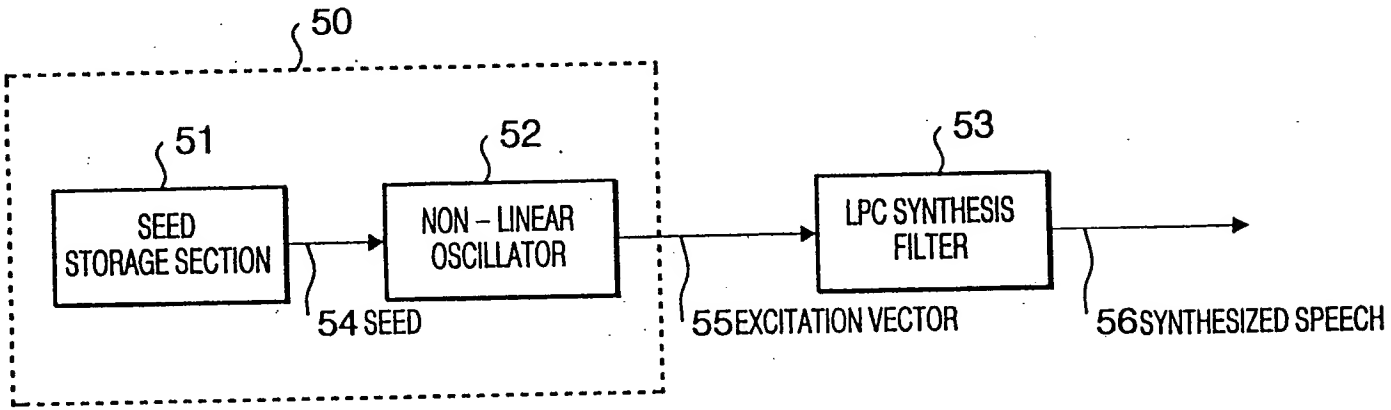
50
51
SEED STORAGE SECTION
52
NON – LINEAR OSCILLATOR
53
LPC SYNTHESIS FILTER
54 SEED
55 EXCITATION VECTOR
56 SYNTHESIZED SPEECH

FIG. 6

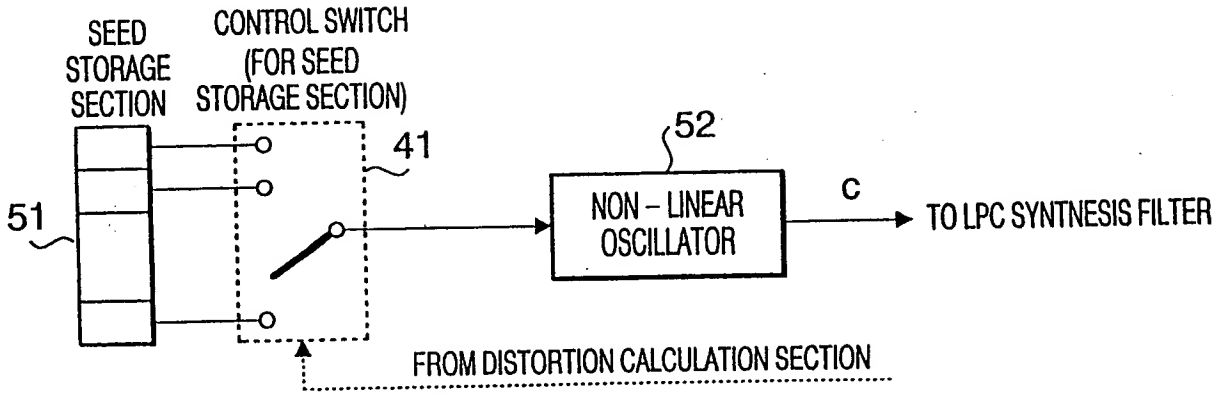
SEED STORAGE SECTION
CONTROL SWITCH (FOR SEED STORAGE SECTION)
41
51
52
NON – LINEAR OSCILLATOR
c
TO LPC SYNTNESIS FILTER
FROM DISTORTION CALCULATION SECTION

FIG. 7

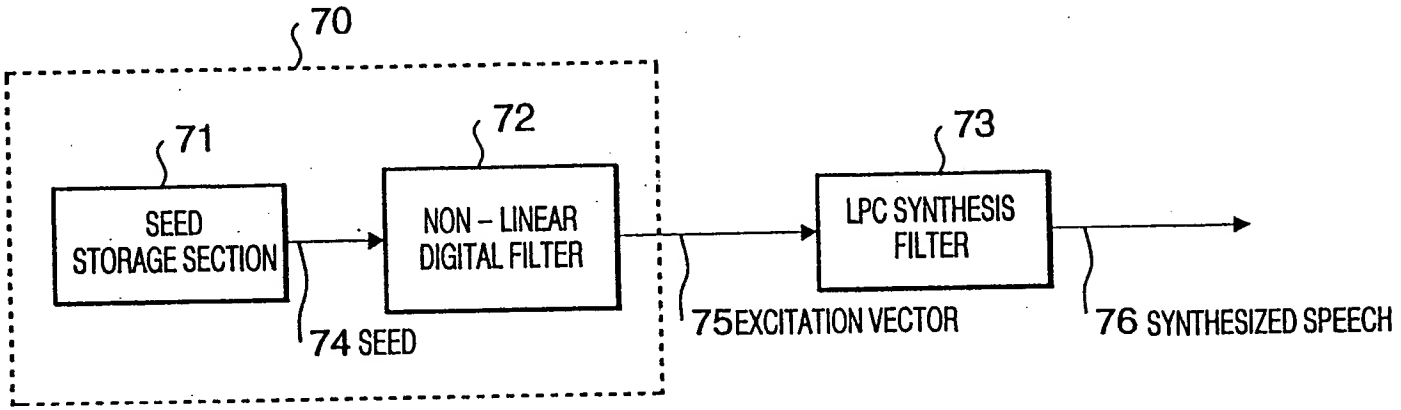
70
71
SEED
STORAGE SECTION
72
NON – LINEAR
DIGITAL FILTER
73
LPC SYNTHESIS
FILTER
74 SEED
75 EXCITATION VECTOR
76 SYNTHESIZED SPEECH

FIG. 8

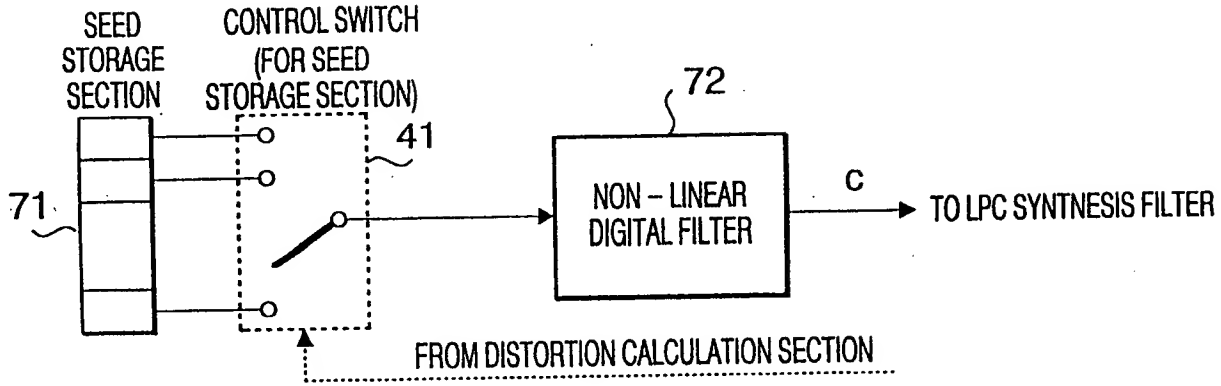
SEED
STORAGE
SECTION
CONTROL SWITCH
(FOR SEED
STORAGE SECTION)
41
71
72
NON – LINEAR
DIGITAL FILTER
C
TO LPC SYNTNESIS FILTER
FROM DISTORTION CALCULATION SECTION

FIG. 9

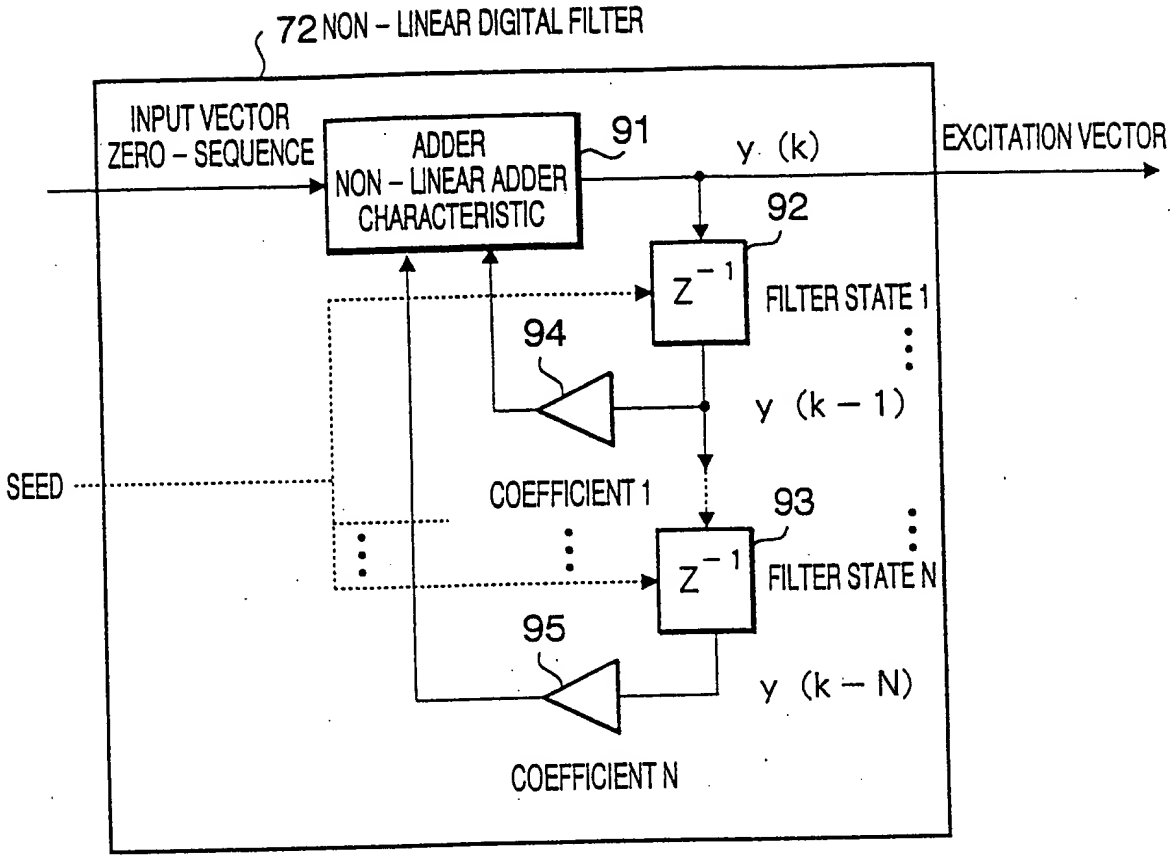
72 NON – LINEAR DIGITAL FILTER
INPUT VECTOR
ZERO – SEQUENCE
ADDER
NON – LINEAR ADDER
CHARACTERISTIC
91
y (k)
EXCITATION VECTOR
92
Z⁻¹
FILTER STATE 1
94
y (k – 1)
SEED
COEFFICIENT 1
93
Z⁻¹
FILTER STATE N
95
y (k – N)
COEFFICIENT N

FIG. 10

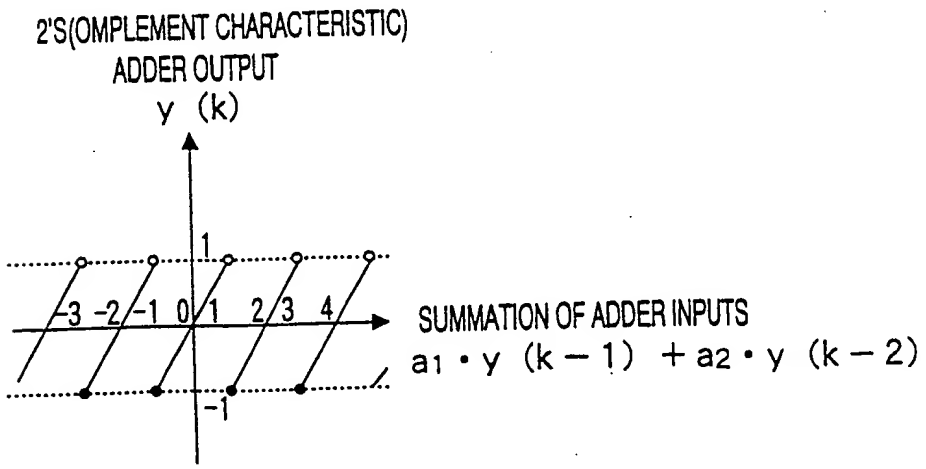
2'S(OMPLEMENT CHARACTERISTIC)
ADDER OUTPUT
y (k)
1
-3 -2 -1 0 1 2 3 4
-1
SUMMATION OF ADDER INPUTS
a1 • y (k – 1) + a2 • y (k – 2)

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FIG. 11

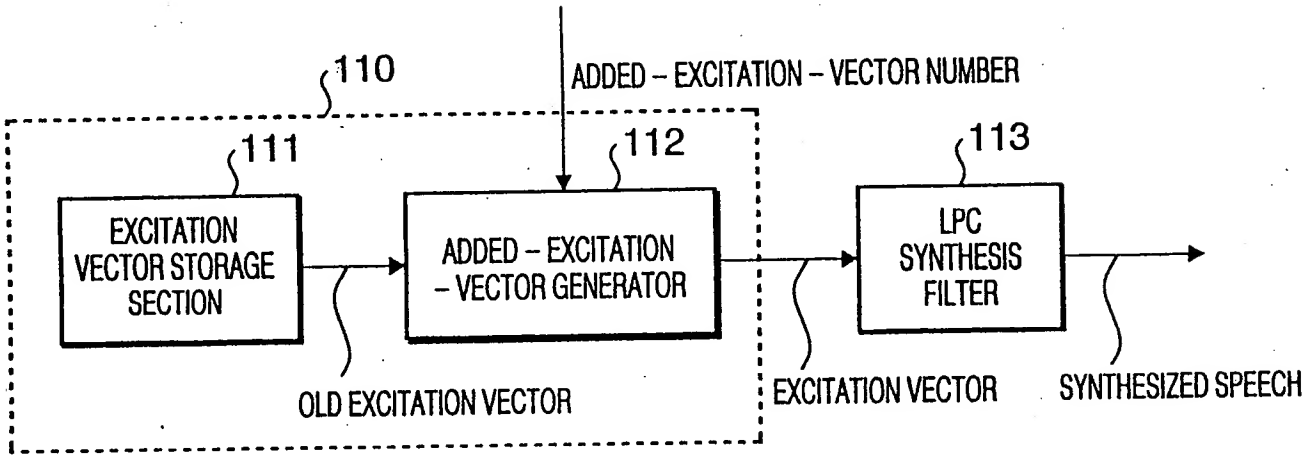

FIG. 12

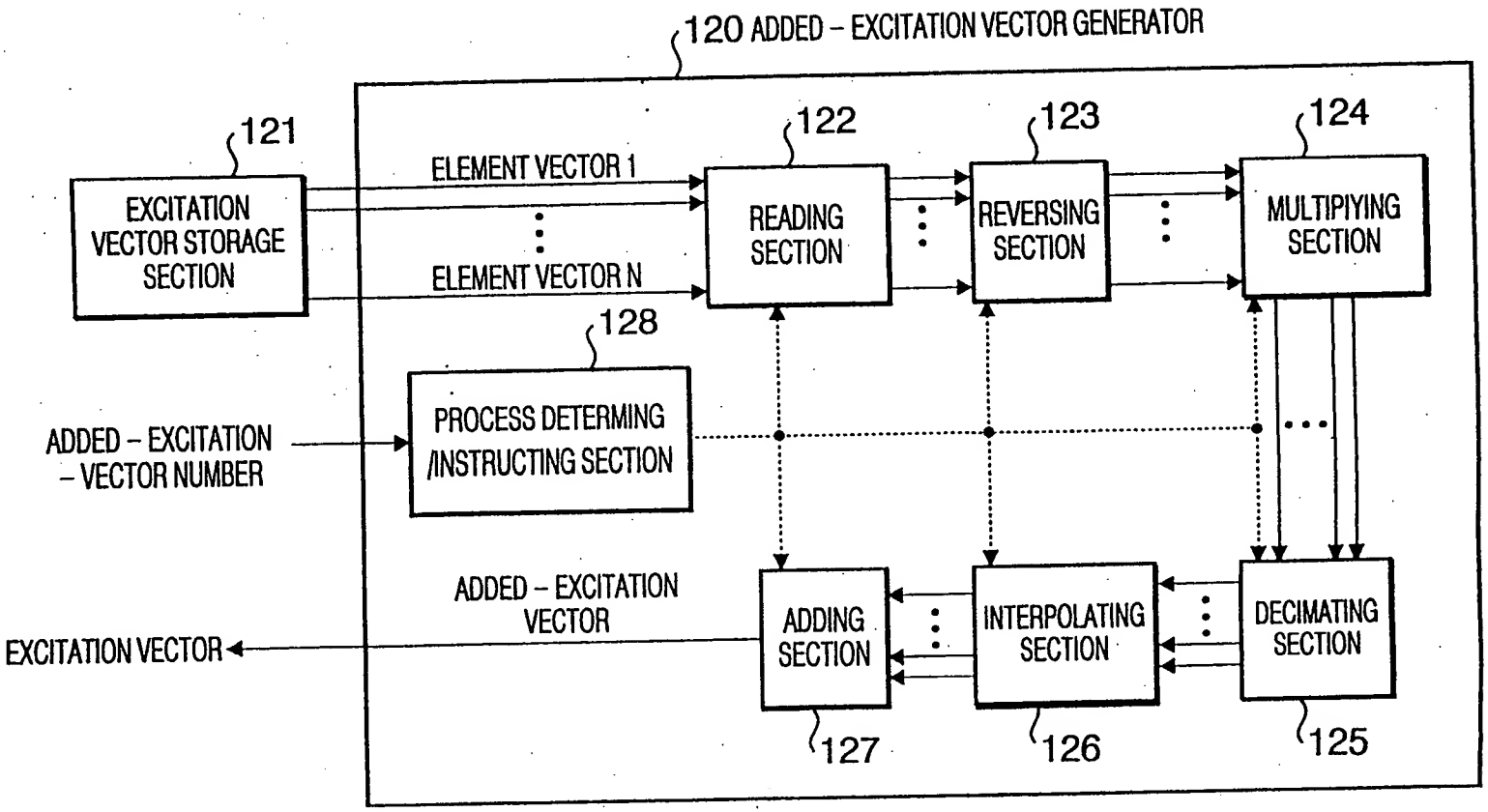
120 ADDED – EXCITATION VECTOR GENERATOR
121
EXCITATION VECTOR STORAGE SECTION
ELEMENT VECTOR 1
ELEMENT VECTOR N
122
READING SECTION
123
REVERSING SECTION
124
MULTIPIYING SECTION
128
PROCESS DETERMING /INSTRUCTING SECTION
ADDED – EXCITATION – VECTOR NUMBER
ADDED – EXCITATION VECTOR
EXCITATION VECTOR
ADDING SECTION
INTERPOLATING SECTION
DECIMATING SECTION
127
126
125

FIG. 13A

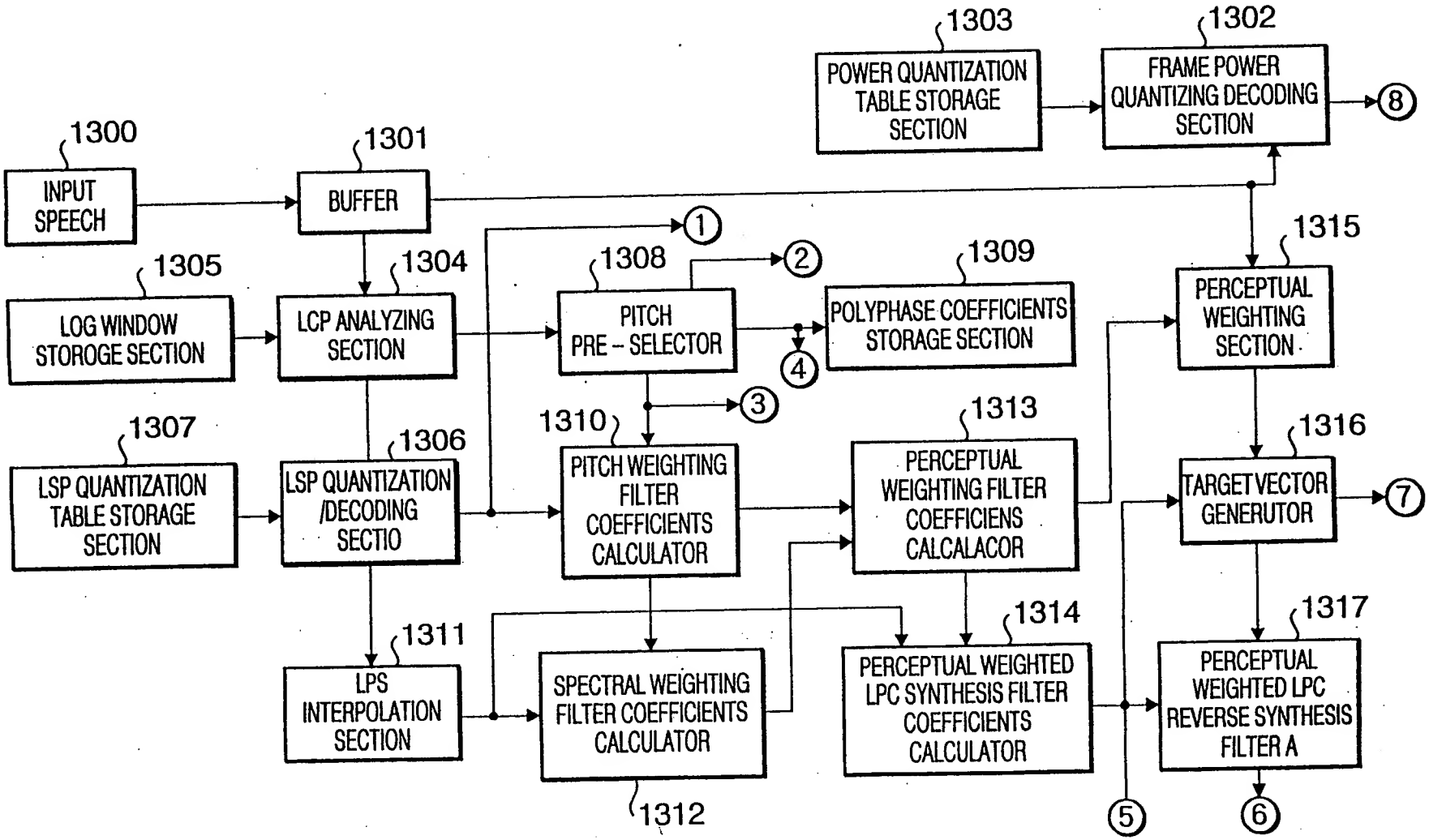
1303
POWER QUANTIZATION TABLE STORAGE SECTION
1302
FRAME POWER QUANTIZING DECODING SECTION
8
1300
INPUT SPEECH
1301
BUFFER
1
1315
PERCEPTUAL WEIGHTING SECTION
1305
LOG WINDOW STOROGE SECTION
1304
LCP ANALYZING SECTION
1308
PITCH PRE – SELECTOR
2
1309
POLYPHASE COEFFICIENTS STORAGE SECTION
4
3
1307
LSP QUANTIZATION TABLE STORAGE SECTION
1306
LSP QUANTIZATION /DECODING SECTIO
1310
PITCH WEIGHTING FILTER COEFFICIENTS CALCULATOR
1313
PERCEPTUAL WEIGHTING FILTER COEFFICIENS CALCALACOR
1316
TARGET VECTOR GENERUTOR
7
1311
LPS INTERPOLATION SECTION
SPECTRAL WEIGHTING FILTER COEFFICIENTS CALCULATOR
1314
PERCEPTUAL WEIGHTED LPC SYNTHESIS FILTER COEFFICIENTS CALCULATOR
1317
PERCEPTUAL WEIGHTED LPC REVERSE SYNTHESIS FILTER A
1312
5
6

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FIG. 13B

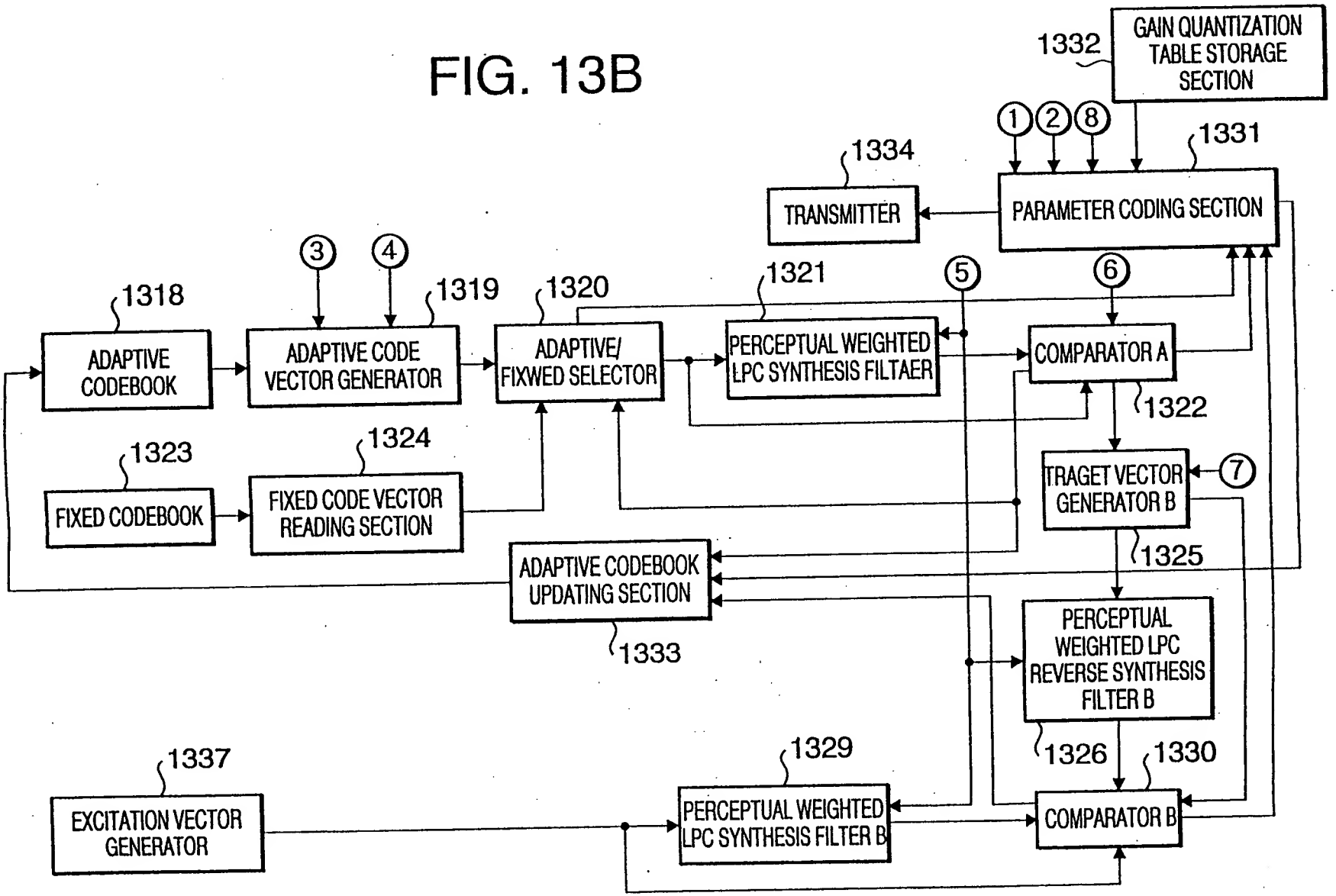

FIG. 14

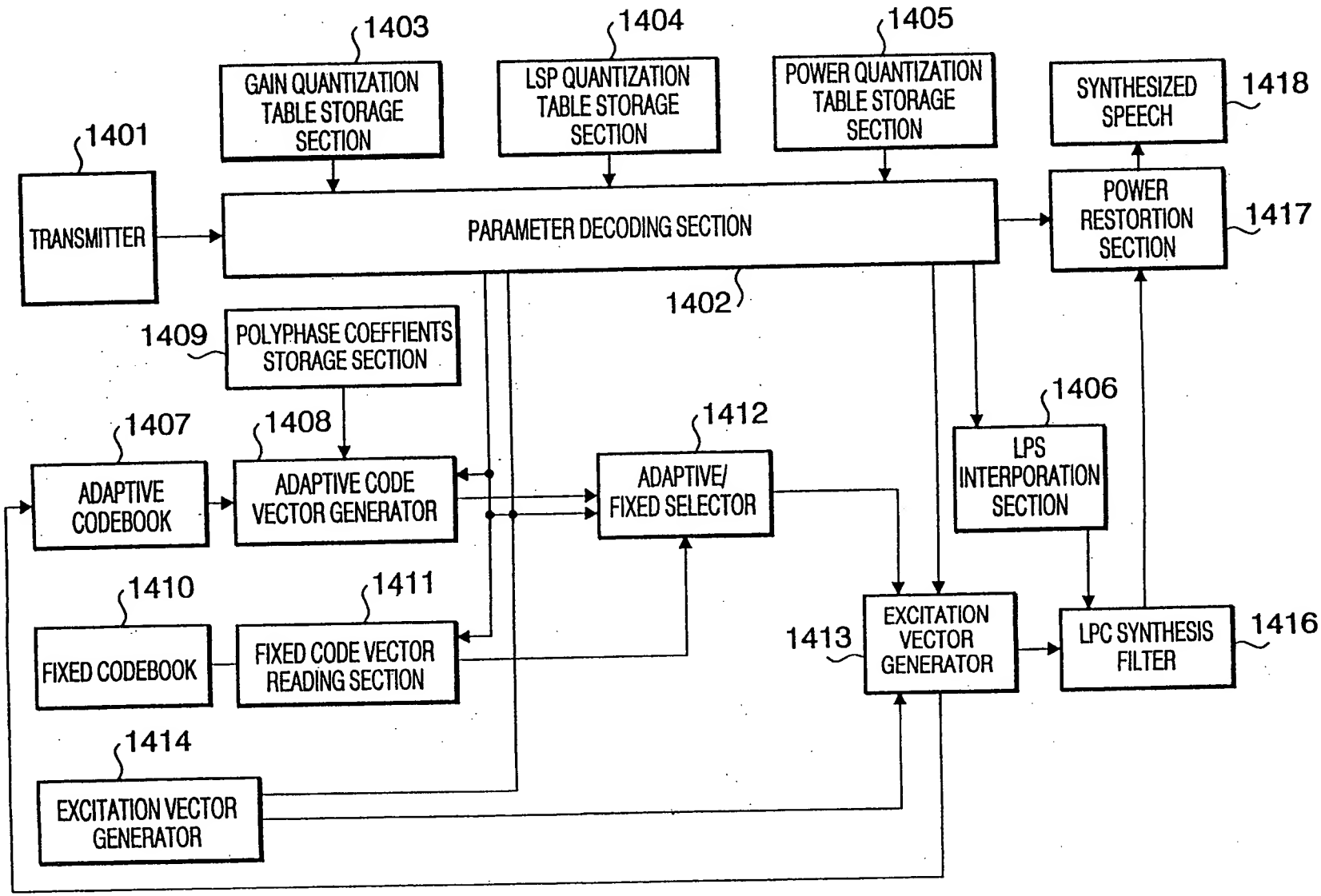
1403
GAIN QUANTIZATION TABLE STORAGE SECTION
1404
LSP QUANTIZATION TABLE STORAGE SECTION
1405
POWER QUANTIZATION TABLE STORAGE SECTION
SYNTHESIZED SPEECH
1418
1401
TRANSMITTER
PARAMETER DECODING SECTION
POWER RESTORTION SECTION
1417
1402
1409
POLYPHASE COEFFIENTS STORAGE SECTION
1406
1407
1408
1412
ADAPTIVE CODEBOOK
ADAPTIVE CODE VECTOR GENERATOR
ADAPTIVE/ FIXED SELECTOR
LPS INTERPORATION SECTION
1410
1411
FIXED CODEBOOK
FIXED CODE VECTOR READING SECTION
1413
EXCITATION VECTOR GENERATOR
LPC SYNTHESIS FILTER
1416
1414
EXCITATION VECTOR GENERATOR

FIG. 15

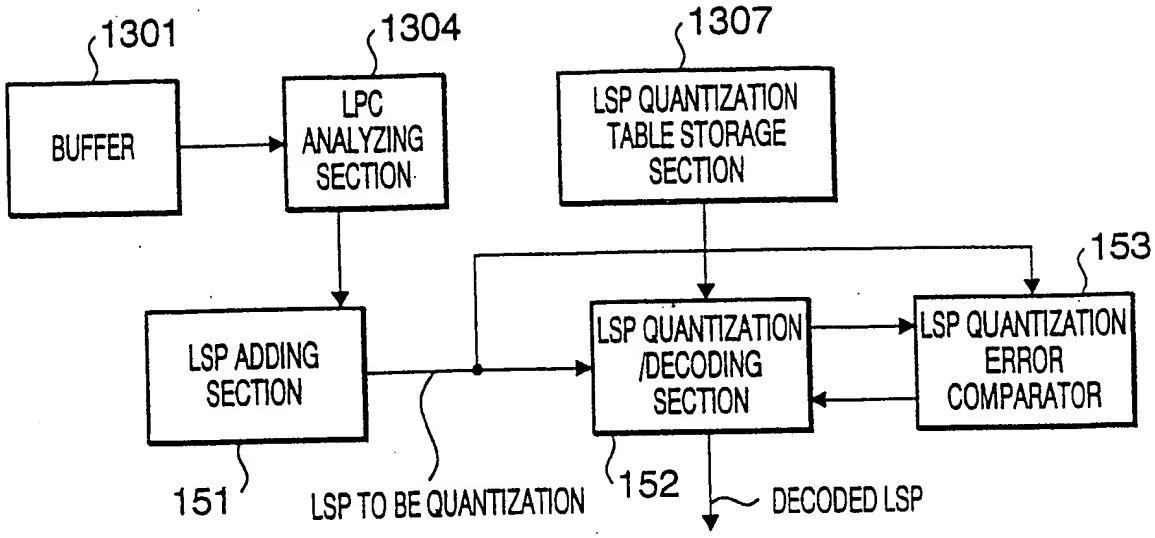
1301
1304
1307
BUFFER
LPC ANALYZING SECTION
LSP QUANTIZATION TABLE STORAGE SECTION
153
LSP ADDING SECTION
LSP QUANTIZATION /DECODING SECTION
LSP QUANTIZATION ERROR COMPARATOR
151
LSP TO BE QUANTIZATION
152
DECODED LSP

FIG. 16

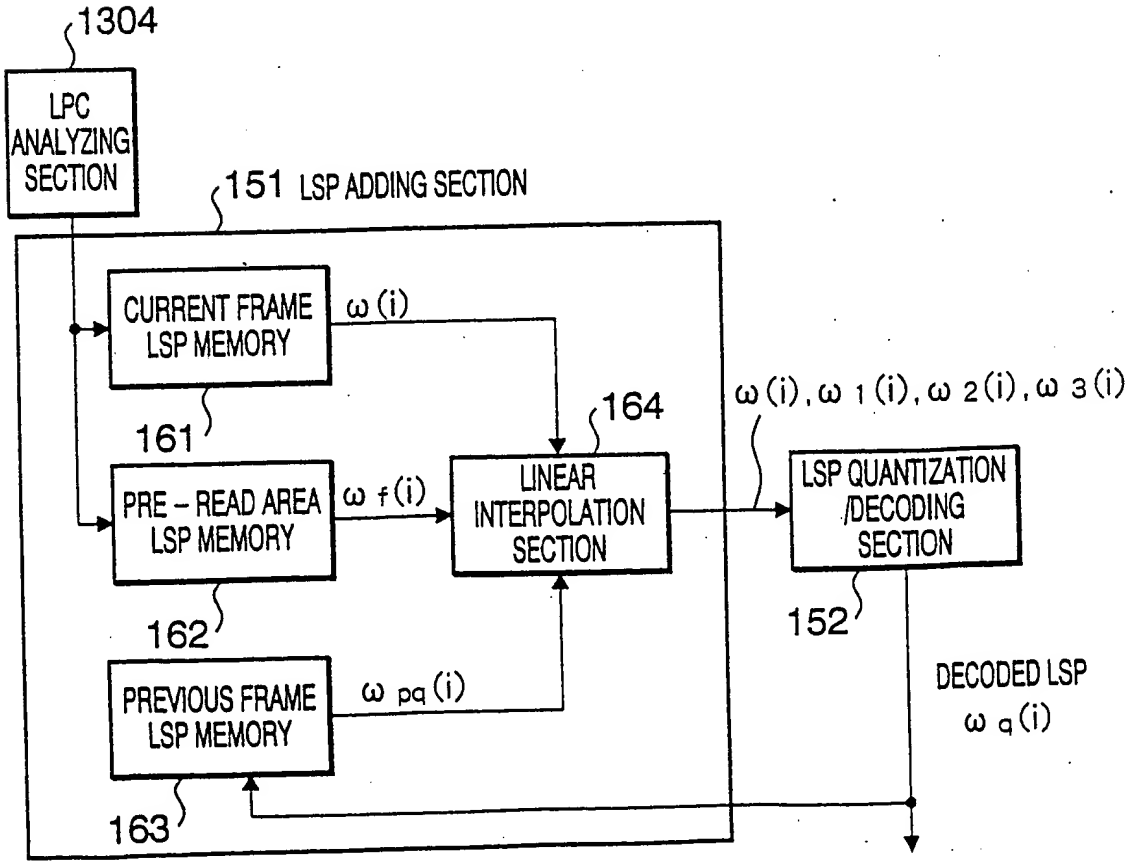
1304
LPC ANALYZING SECTION
151 LSP ADDING SECTION
CURRENT FRAME LSP MEMORY
ω (i)
161
PRE – READ AREA LSP MEMORY
ω f (i)
LINEAR INTERPOLATION SECTION
164
ω (i), ω 1 (i), ω 2 (i), ω 3 (i)
LSP QUANTIZATION /DECODING SECTION
152
DECODED LSP
ω q (i)
162
PREVIOUS FRAME LSP MEMORY
ω pq (i)
163

FIG. 17

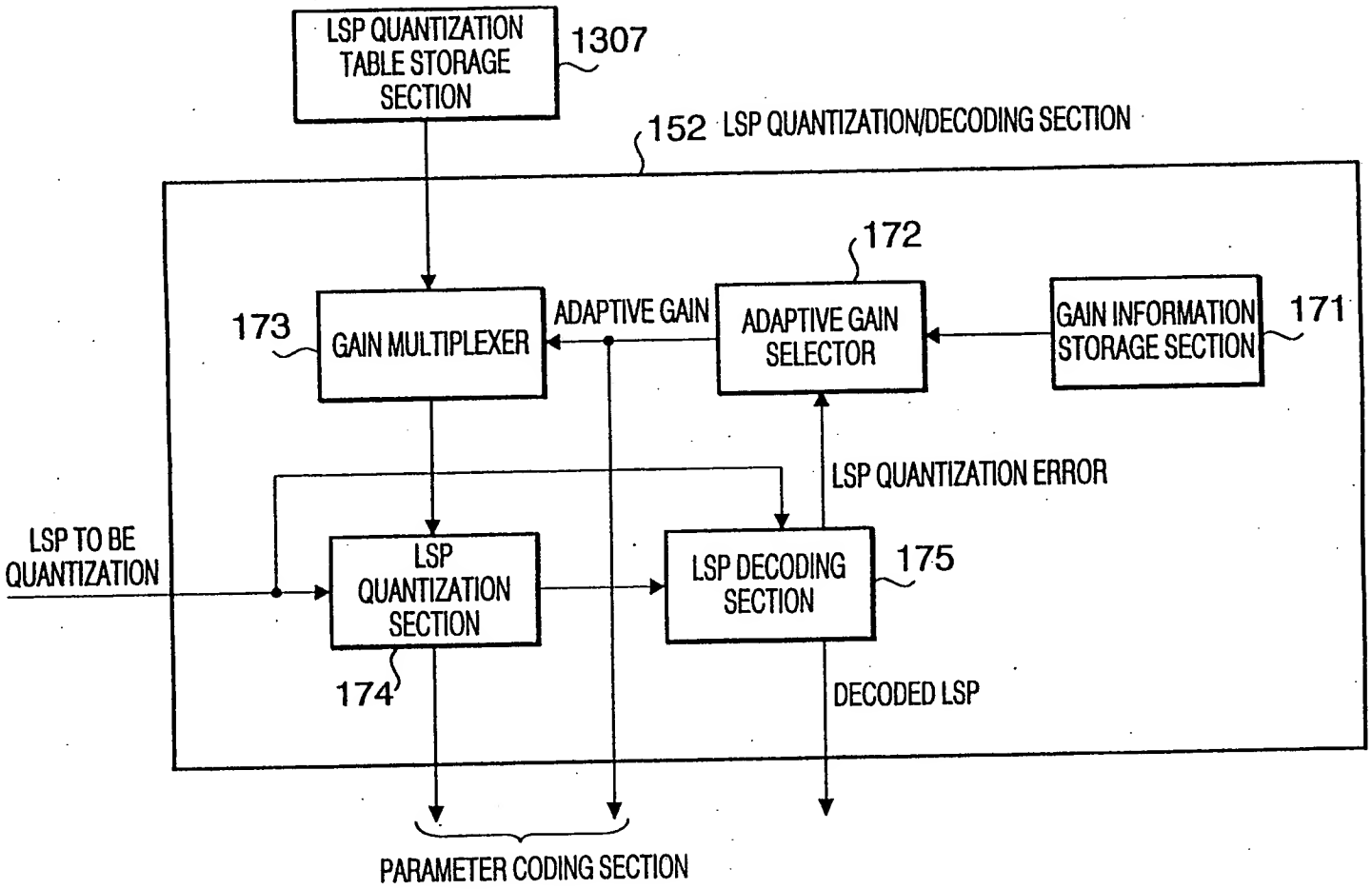
LSP QUANTIZATION TABLE STORAGE SECTION
1307
152 LSP QUANTIZATION/DECODING SECTION
172
173
GAIN MULTIPLEXER
ADAPTIVE GAIN
ADAPTIVE GAIN SELECTOR
GAIN INFORMATION STORAGE SECTION
171
LSP QUANTIZATION ERROR
LSP TO BE QUANTIZATION
LSP QUANTIZATION SECTION
LSP DECODING SECTION
175
174
DECODED LSP
PARAMETER CODING SECTION

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FIG. 18

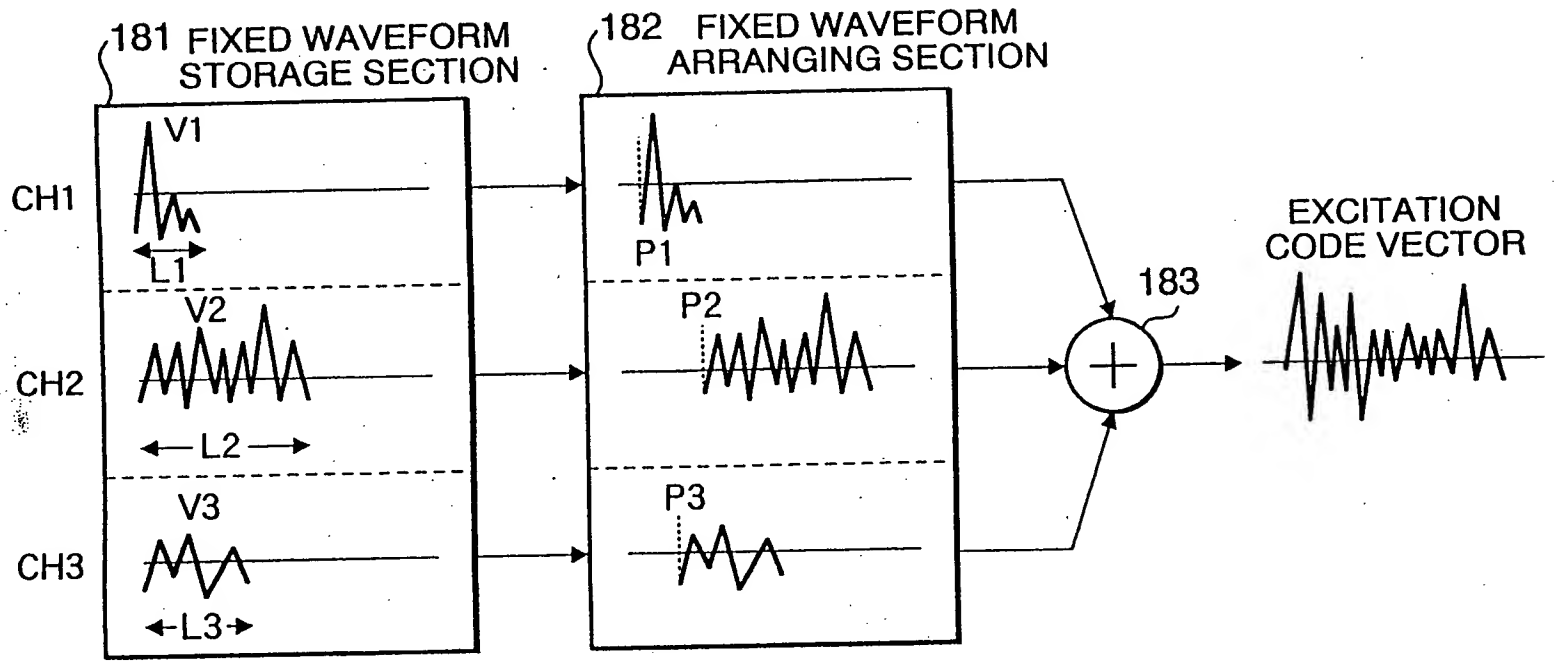

FIG. 19A

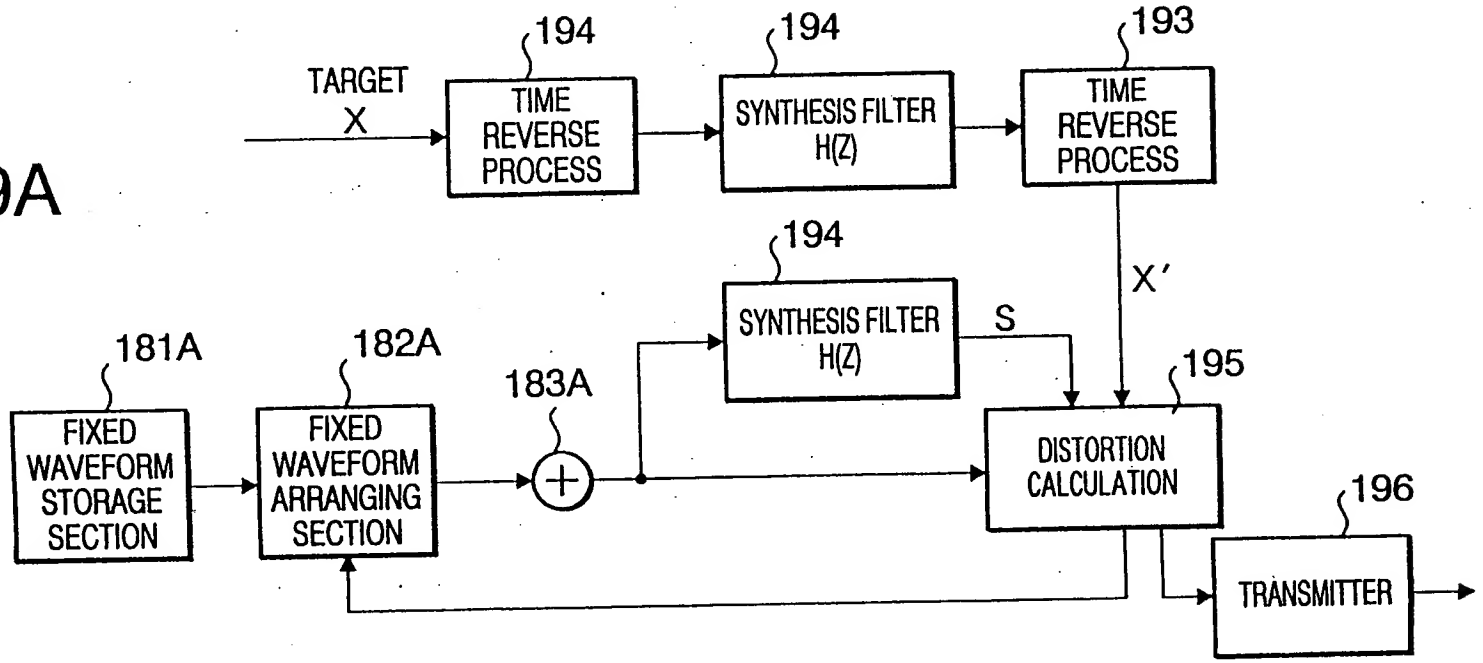

FIG. 19B

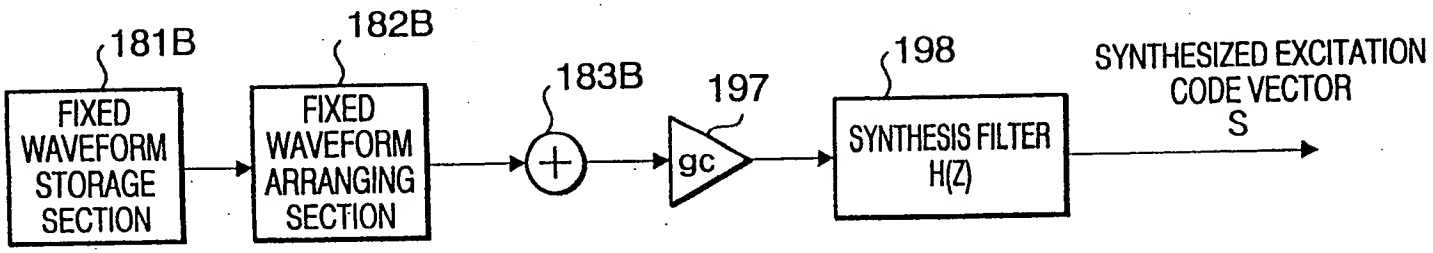

FIG. 20

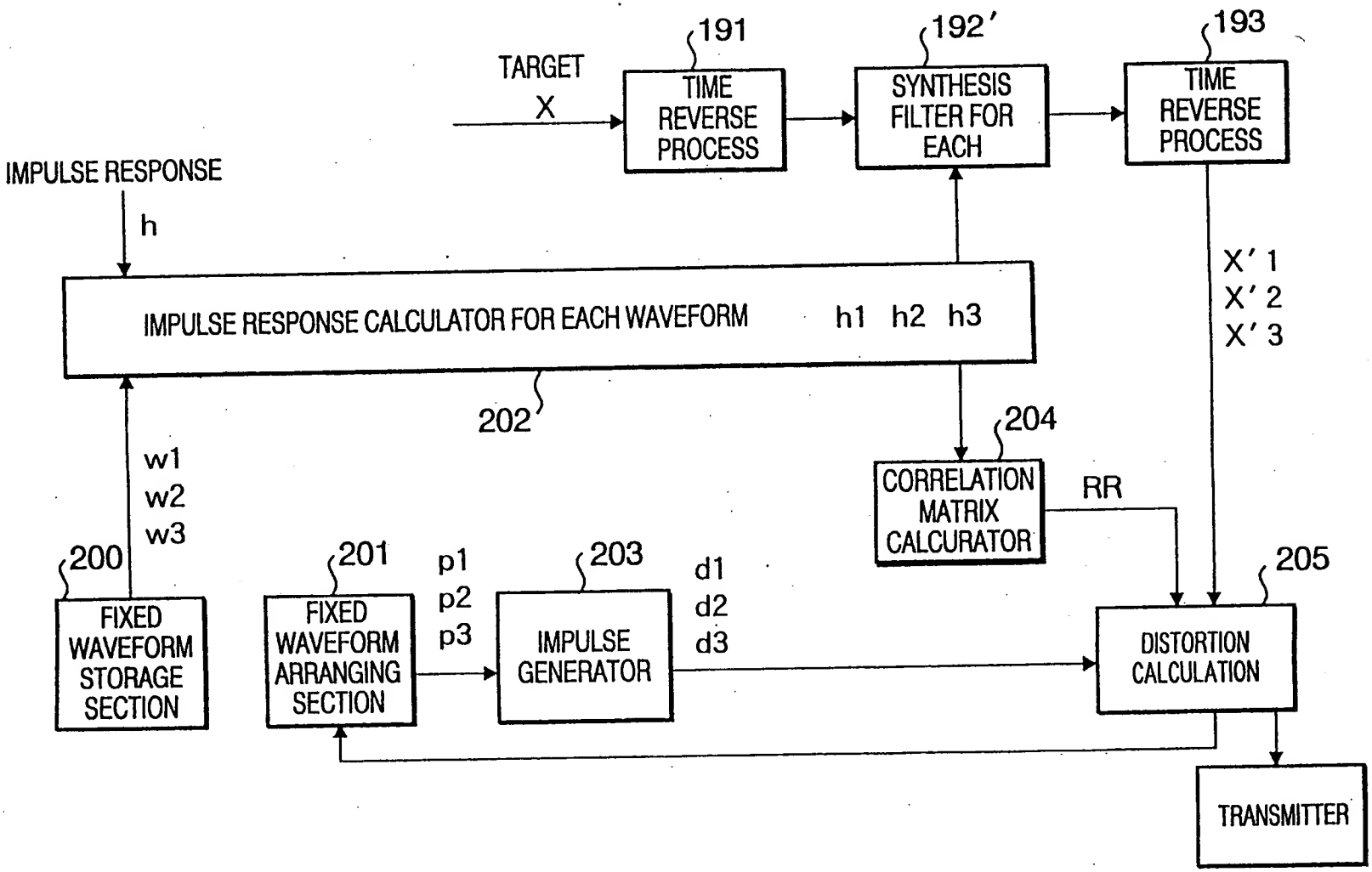
TARGET
X
191
TIME REVERSE PROCESS
192'
SYNTHESIS FILTER FOR EACH
193
TIME REVERSE PROCESS
IMPULSE RESPONSE
h
X'1
X'2
X'3
IMPULSE RESPONSE CALCULATOR FOR EACH WAVEFORM h1 h2 h3
202
204
CORRELATION MATRIX CALCURATOR
RR
w1
w2
w3
200
FIXED WAVEFORM STORAGE SECTION
201
FIXED WAVEFORM ARRANGING SECTION
p1
p2
p3
203
IMPULSE GENERATOR
d1
d2
d3
205
DISTORTION CALCULATION
TRANSMITTER

FIG. 21

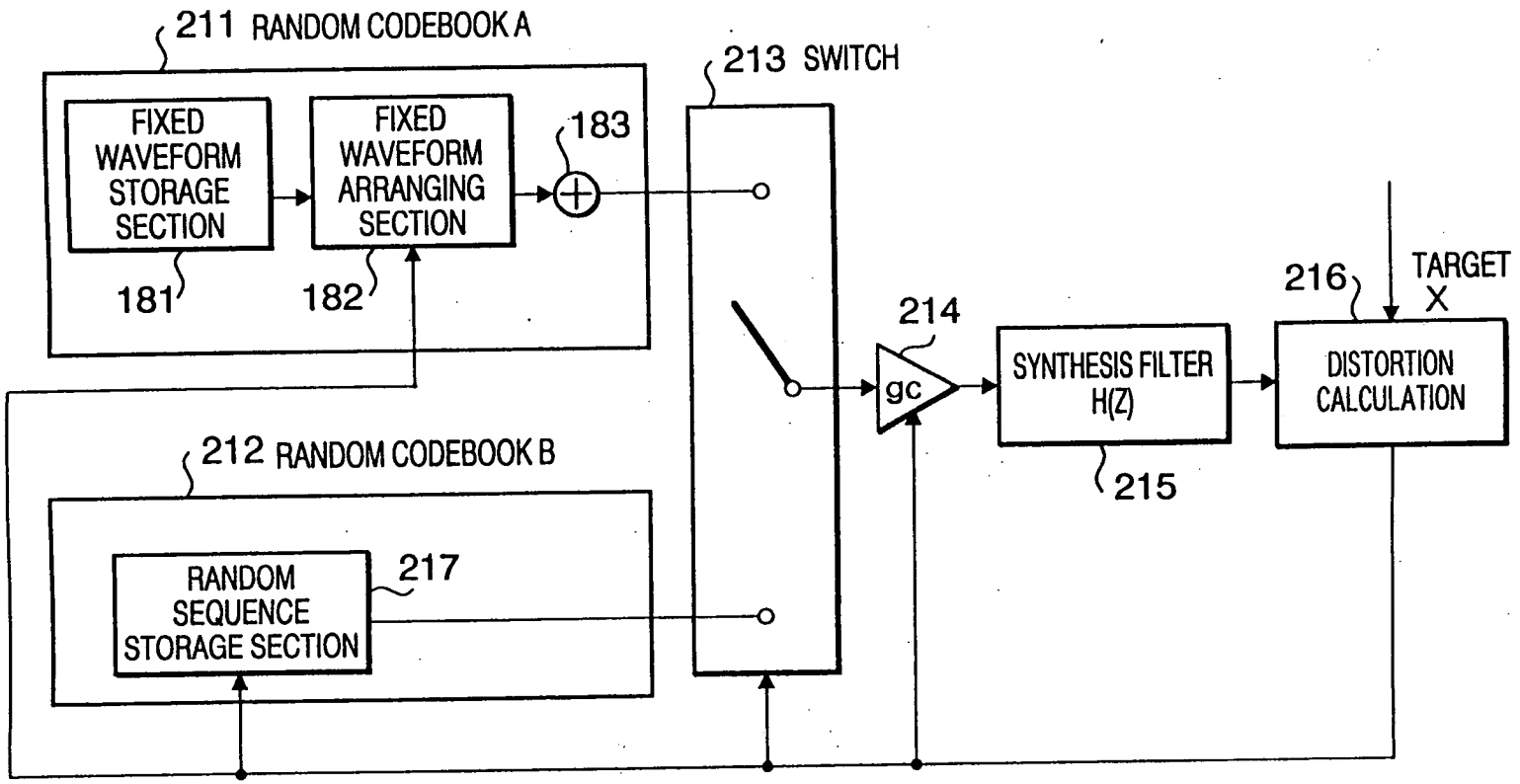
211 RANDOM CODEBOOK A
FIXED WAVEFORM STORAGE SECTION
FIXED WAVEFORM ARRANGING SECTION
183
181
182
213 SWITCH
214
gc
SYNTHESIS FILTER H(Z)
215
216
TARGET X
DISTORTION CALCULATION
212 RANDOM CODEBOOK B
RANDOM SEQUENCE STORAGE SECTION
217

FIG. 22

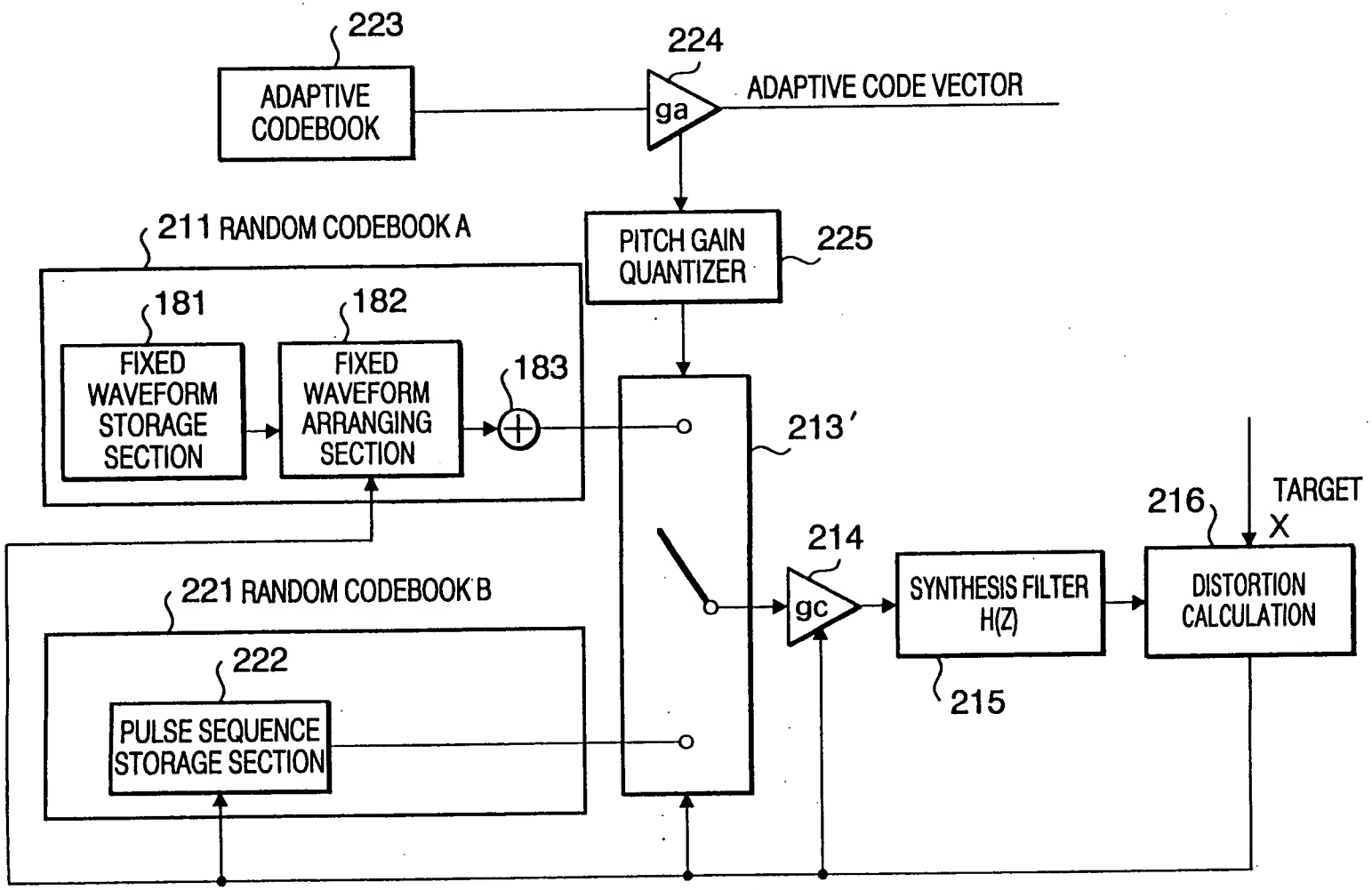
223
ADAPTIVE CODEBOOK
224
ga
ADAPTIVE CODE VECTOR
211 RANDOM CODEBOOK A
PITCH GAIN QUANTIZER
225
181
182
FIXED WAVEFORM STORAGE SECTION
FIXED WAVEFORM ARRANGING SECTION
183
213'
216
TARGET X
214
221 RANDOM CODEBOOK B
gc
SYNTHESIS FILTER H(Z)
DISTORTION CALCULATION
222
PULSE SEQUENCE STORAGE SECTION
215

FIG. 23

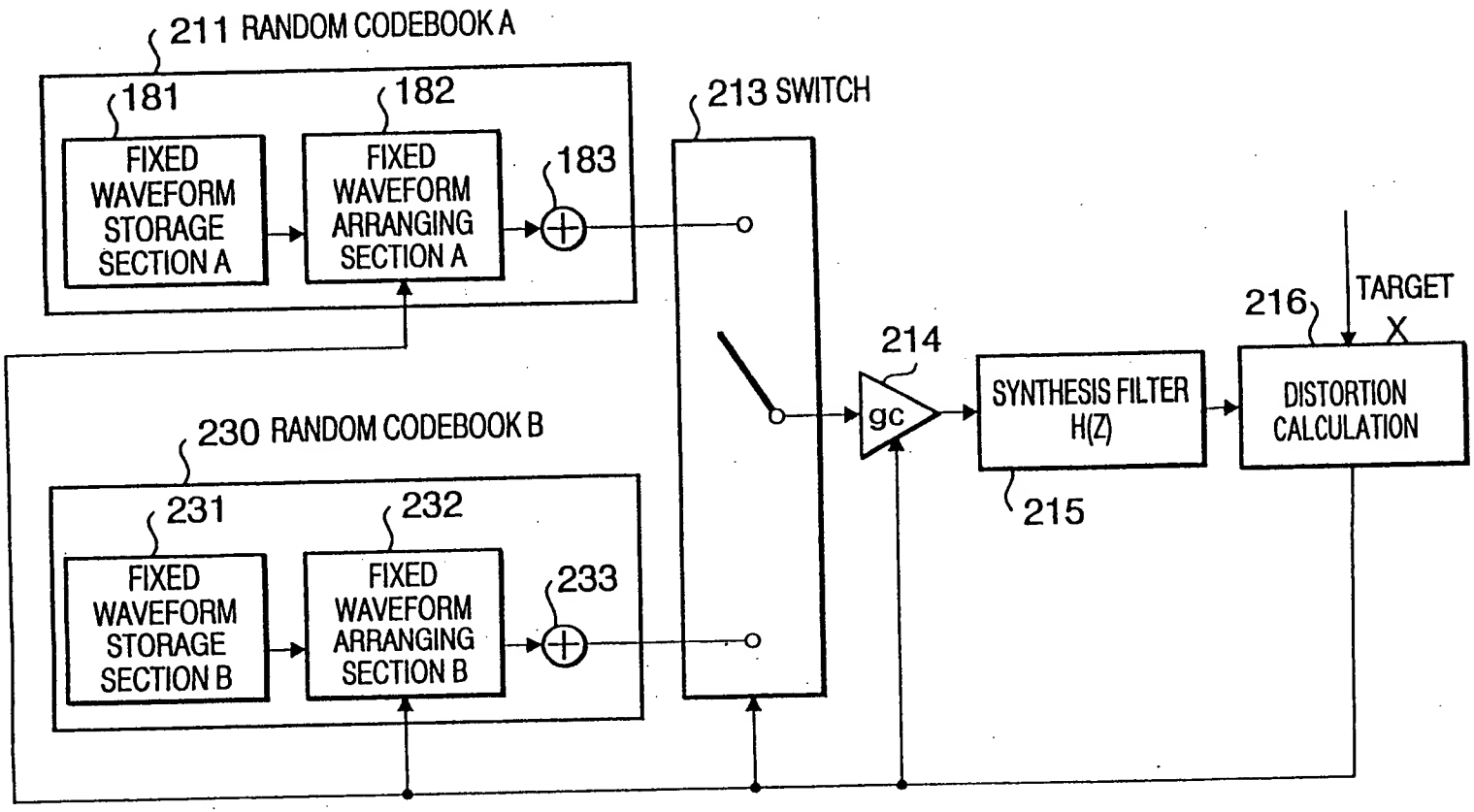
211 RANDOM CODEBOOK A
181
182
FIXED WAVEFORM STORAGE SECTION A
FIXED WAVEFORM ARRANGING SECTION A
183
213 SWITCH
230 RANDOM CODEBOOK B
231
232
FIXED WAVEFORM STORAGE SECTION B
FIXED WAVEFORM ARRANGING SECTION B
233
214
gc
SYNTHESIS FILTER H(Z)
215
216
TARGET X
DISTORTION CALCULATION

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FIG. 24

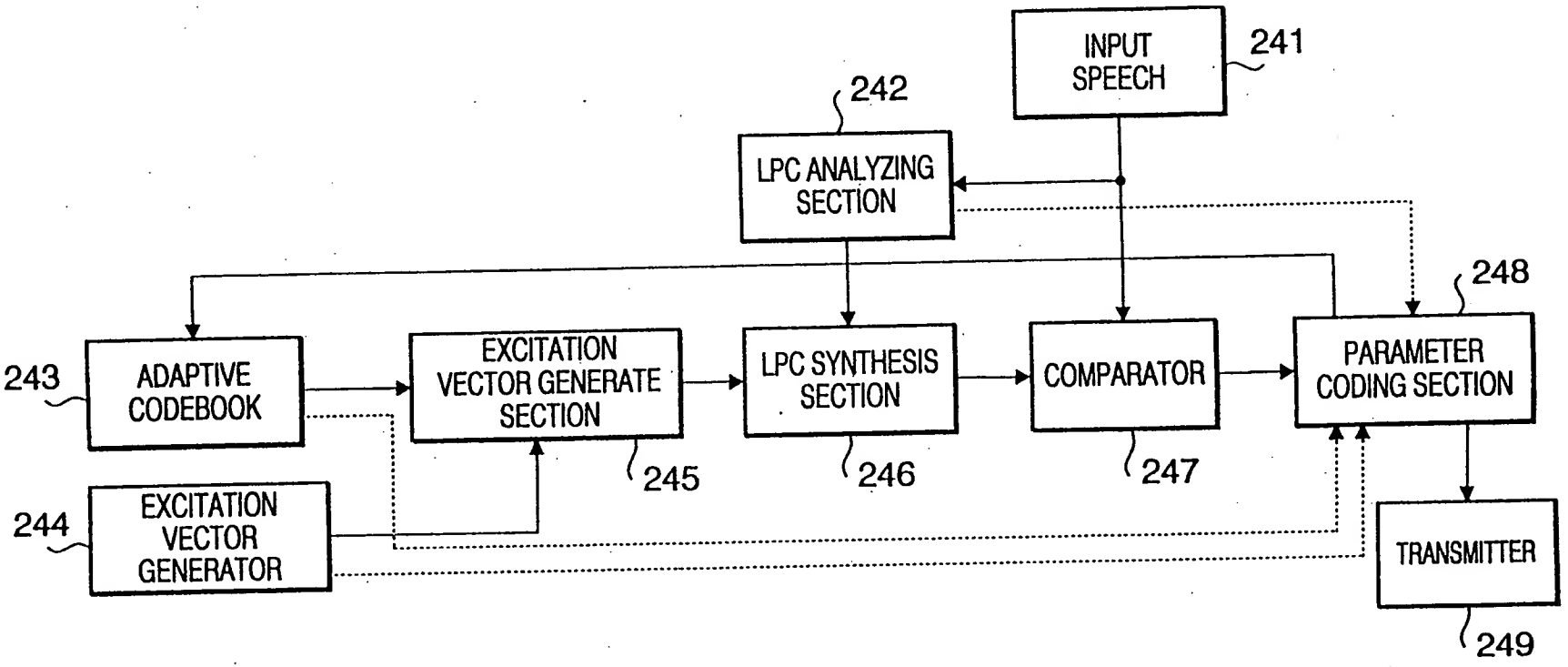
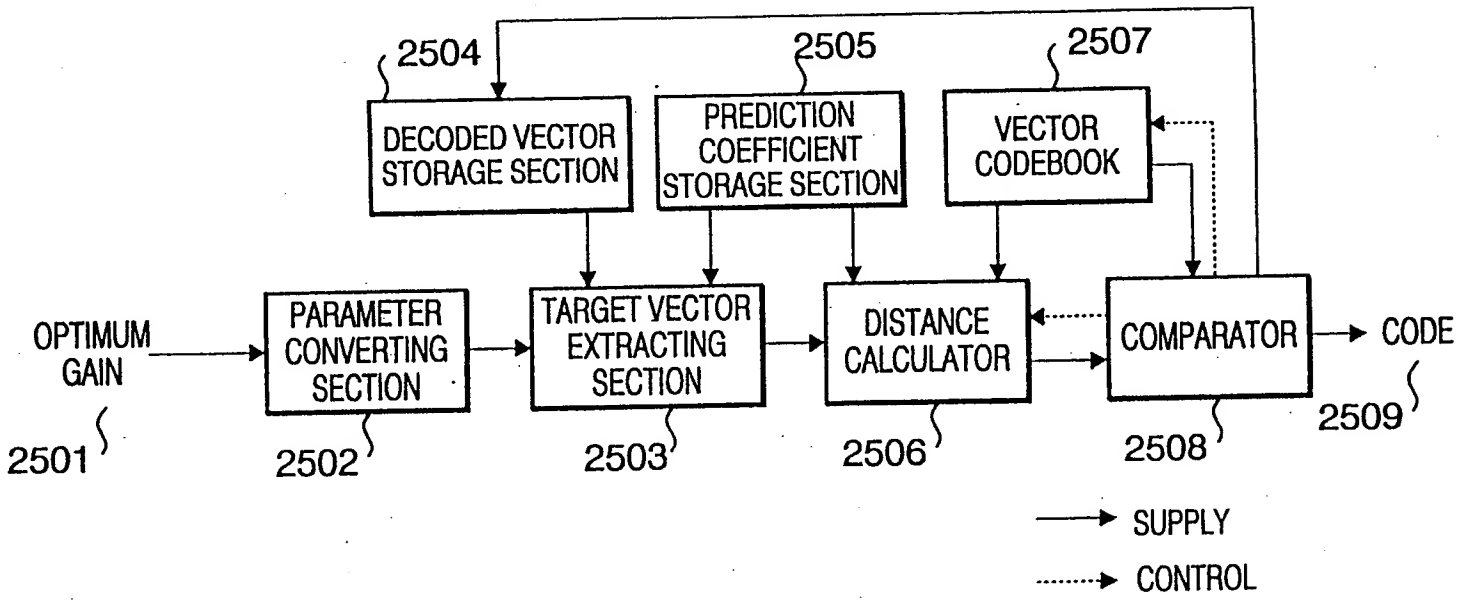


FIG. 25


2504
2505
2507
DECODED VECTOR STORAGE SECTION
PREDICTION COEFFICIENT STORAGE SECTION
VECTOR CODEBOOK
OPTIMUM GAIN
PARAMETER CONVERTING SECTION
TARGET VECTOR EXTRACTING SECTION
DISTANCE CALCULATOR
COMPARATOR
CODE
2501
2502
2503
2506
2508
2509
SUPPLY
CONTROL

T0E+0" 6E6E+850

FIG. 26

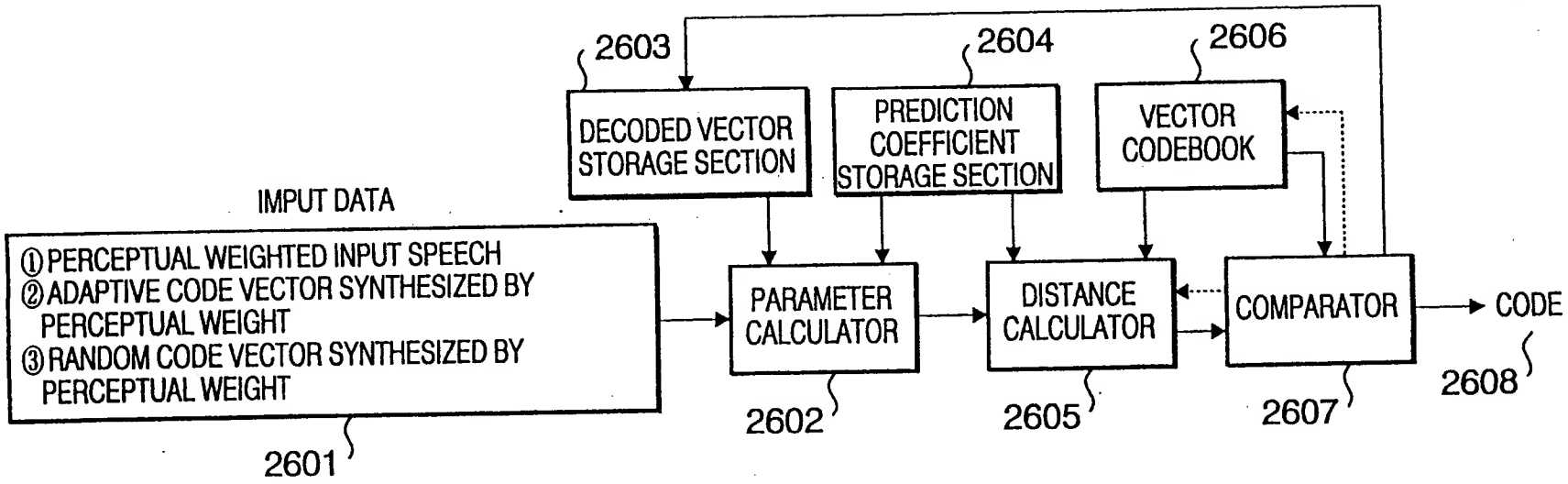
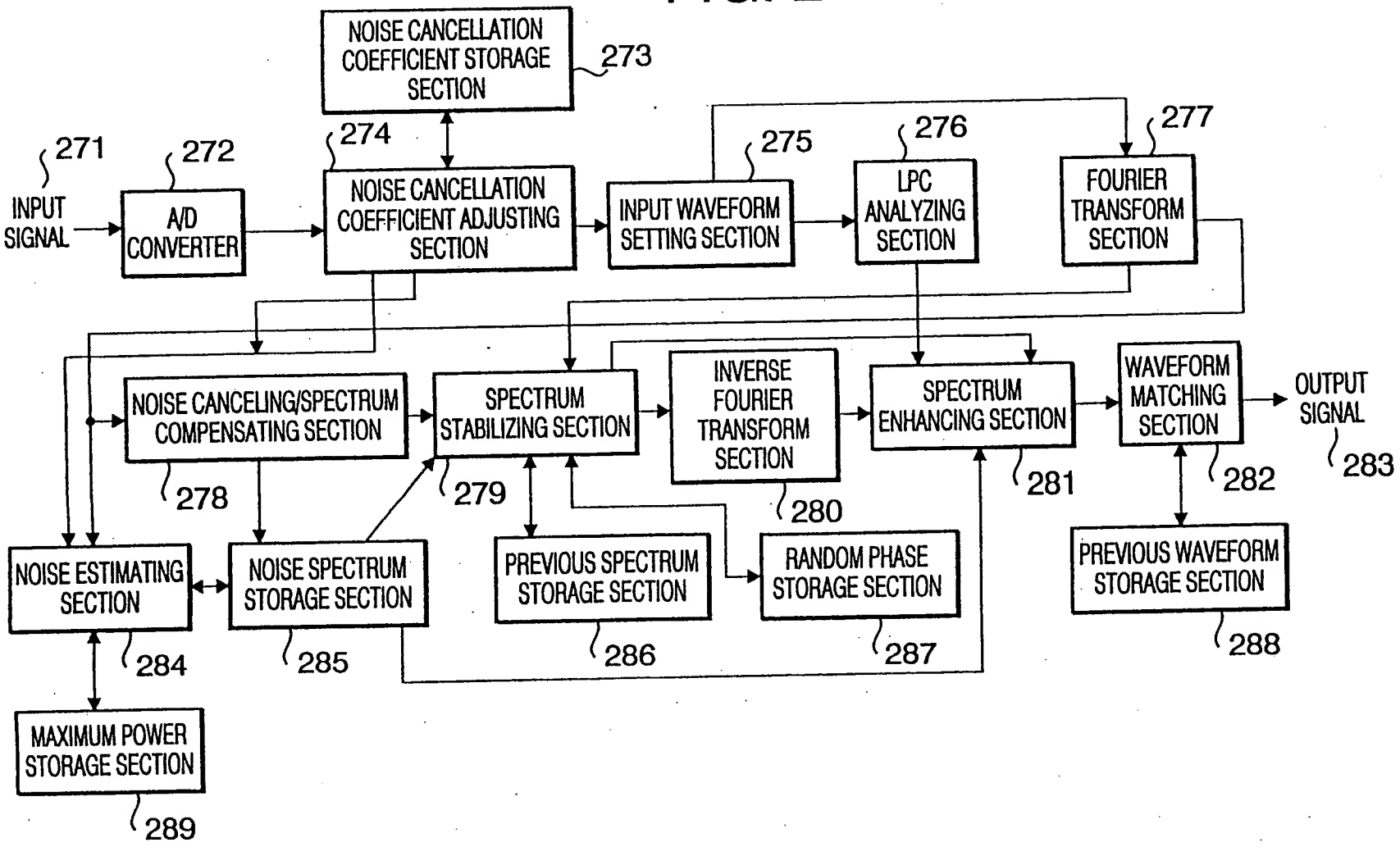


FIG. 27


NOISE CANCELLATION COEFFICIENT STORAGE SECTION
273
271
INPUT SIGNAL
272
A/D CONVERTER
274
NOISE CANCELLATION COEFFICIENT ADJUSTING SECTION
275
INPUT WAVEFORM SETTING SECTION
276
LPC ANALYZING SECTION
277
FOURIER TRANSFORM SECTION
NOISE CANCELING/SPECTRUM COMPENSATING SECTION
278
SPECTRUM STABILIZING SECTION
279
INVERSE FOURIER TRANSFORM SECTION
280
SPECTRUM ENHANCING SECTION
281
WAVEFORM MATCHING SECTION
282
OUTPUT SIGNAL
283
NOISE ESTIMATING SECTION
284
NOISE SPECTRUM STORAGE SECTION
285
PREVIOUS SPECTRUM STORAGE SECTION
286
RANDOM PHASE STORAGE SECTION
287
PREVIOUS WAVEFORM STORAGE SECTION
288
MAXIMUM POWER STORAGE SECTION
289